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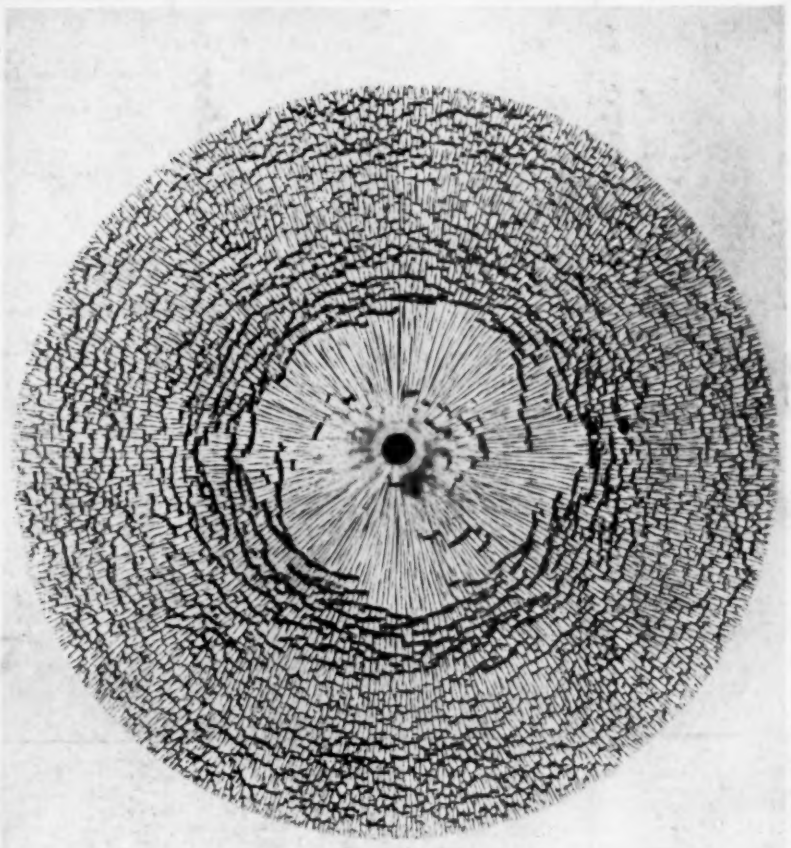
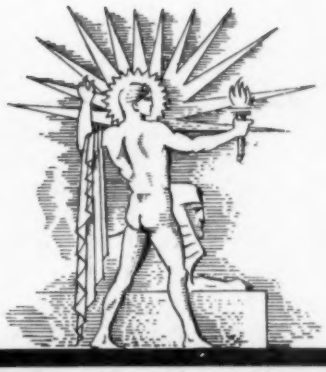
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •





December 10, 1938

Mile a Second

See Page 376

A SCIENCE SERVICE PUBLICATION

Do You Know?

About a million American families now use cold storage lockers to keep perishable supplies.

A dress worn by a movie star recently was made of 27 quarts of milk, converted into beads.

To enable trucks to navigate deep mud and marshes, one company has produced a convertible unit with giant tires.

Cleanliness is emphasized in the first soda-fountain training course in the United States, given in a New York City high school.

A laboratory room cut out of ice and furnished in ice slabs was recently used by an expedition studying composition of glaciers in the Swiss Alps.

In reading print the eye depends mostly on the tops of words, as you can prove by covering the upper, and then the lower, part of a printed line.

A storage battery in good condition, says an automotive engineer, is 100 per cent. efficient at 80 degrees F., whereas at zero its efficiency drops to 42 per cent, due to effects of cold on the acid and plate materials.

Some of the remarkable treasures found in a Peruvian burial mound recently will be exhibited at the San Francisco fair, including a ceremonial knife mounted with a golden, winged image of a god-king.

QUESTIONS DISCUSSED IN THIS ISSUE

Most articles which appear in SCIENCE NEWS LETTER *are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.*

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Where is infant mortality only three-fifths as high as in the United States? p. 377.

SEISMOLOGY

Where has a new earthquake observatory been established? p. 375.

A new section of Mammoth Cave recently explored is said to be the most beautiful portion yet discovered.

Seeking to know why some beets are redder than others, chemists have extracted and measured the red pigment in beet roots.

The Office of Indian Affairs has helped Navajo Indians to increase their wells, springs, and other water sources to 1,862, from 240 in 1928.

Apple syrup is a new rival of maple syrup.

A new interstate park on the North Carolina-Tennessee line will be on a mountaintop free from pollens feared by hay fever sufferers.

Glass fiber is being made into gaskets that are said to resist most acids.

It takes three feet of sugarcane to make a lump of sugar.

SCIENCE NEWS LETTER

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PHYSICS

Mesotrons Penetrate Solids Easier Than They Do Air

Subatomic Particle Is Found To Be Radioactive; Breaks Down in Average of Two Millionths of Second

STONE walls may make a prison and strong armor plate will stop a shell but physicists are now studying an amazing atomic particle which will penetrate dense solid material better than it will air or a gas.

The particle is the heavy electron discovered in 1937 by American scientists in cosmic ray studies, to which the name mesotron has now been given.

In two reports (*Nature,* Dec. 3) two outstanding scientists, Dr. P. M. S. Blackett of the University of Manchester, and Dr. Bruno Rossi, Italian physicist now at the Institute for Theoretical Physics, Copenhagen, describe new properties about the strange mesotron. The mesotron has an electrical charge like an electron but has a mass intermediate between that of an electron and a proton.

The mesotron, declares Dr. Blackett, has been shown to be radioactively unstable and breaks down with a mean time of decay of about 0.000002 seconds (two millionths of a second). It is this hitherto unrealized instability which explains the baffling differences of absorption of mesotrons in air and in dense materials like lead.

It is this factor, probably, which explains the discovery that mesotrons penetrate deeply into the earth and appear in experiments performed deep under ground in mines and caves.

Dr. Rossi reports experiments made at altitudes of 7,775 feet in which it was found that the mesotrons were much more reduced in intensity in passing through air than they were in passing through an equivalent amount of dense lead.

"The difference between the lead and the air absorption," states Dr. Rossi, "for which no satisfactory explanation had been found at that time, can now easily be accounted for on the disintegration hypothesis (of mesotrons)."

The seemingly queer disintegration of a single atomic particle is explained by saying that the mesotron breaks up into an electron and into a neutrino with the original heavy mass of the mesotron appearing in its offspring as great kinetic energy.

Science News Letter, December 10, 1938

YOUTH ARMY—ANCIENT ROMAN STYLE

When Italy's Duce reviews his youth army of child black-shirts, he is doing what the Romans did, long ago. This carving shows a Roman youth parade, with the embryo warriors on pony-back in close formation, following a forward-pointing banner. Treasured at Klagenfurt Museum, in what was formerly Austria, the carving is a relic unearthed nearby at the provincial Roman town of Virunum.

GENERAL SCIENCE

Theory vs. Test Is Science Conflict in Nazi-Jew Fight

OBSCURED by the violent outburst of persecution of the Jews in Germany is a related scientific controversy that involves science leaders from Aristotle to Einstein.

Theory vs. experiment. Dogmatism vs. pragmatism. Induction vs. deduction. Invention vs. observation. Idealism vs. realism. Those are some of the labels of the conflict. In one sense the problem is as old as science itself, but unhappy misunderstanding flames anew under the prod of Nazi intolerance and intellectual bigotry. Not entirely made in Germany, some of its most acute symptoms arise there.

Earlier this year Prof. J. Stark, Nobelist in physics in 1919 and now president of the Physikalisch-Technischen Reichanstalt of Berlin-Charlottenburg, made a rather vicious attack on the dogmatic type of mentality in physics, charging that "the natural inclination to dogmatic thought appears with especial frequency in people of Jewish origin." Einstein and "his dogmatic imitators" were particularly attacked.

Prof. Stark's statements met with cold disfavor among physicists, many of whom felt that they carried their own refutation. But now a half year later, also in the British journal, Nature, Prof. A. S. Eve, retired from McGill University and living in England, answers and discusses foundations of physics in the light of modern relationships between theory and experiment.

No hard and fast line can be drawn between theory and experiment. One rises out of the other, in fruitful cycles. This has been particularly true of recent advances in the realm of the atom and the universe: Relativity, radioactivity, quantum, quantum mechanics, etc. Ideas called dogmatic by some have led directly to the pragmatic.

And who would have expected Faraday's experiment enriched by Maxwell's theory to lead to radio and telephones on one hand and the electrical power industry on the other?

Reviewing the practical (pragmatic) results of theoretical (dogmatic) work, Prof. Eve feels that "to link such discoveries mainly with the Jewish people is a poor compliment to the rest of mankind." *Science News Letter, December 10, 1938*

GEOLOGY—ETHNOLOGY

Geology and Ethnology Disagree About Rock Prints

Former Sure Tracks Were Made by Animal Feet in Sand; Ethnologist Believes Them Carvings by Ancient Men

GEOLOGY and ethnology seem to be at odds regarding the nature of the now famous impressions in the rocks, shaped somewhat like human footprints yet certainly not made by human feet. (See SNL, Oct. 29)

Geologists for the present are confining their attention mainly to two sets of the markings, both near Berea, Ky., which Prof. W. G. Burroughs of Berea College, is sure were made by actual animal feet, back in Coal Age days when the stuff that is now stone was soft, wet sand. He has the backing of Charles W. Gilmore of the Smithsonian Institution, who calls attention to the fact that tracks in other localities that most nearly resemble the Berea prints are in rocks of the same geological age. Mr. Gilmore has not visited the Berea site, but he has critically examined detailed photographs of the markings.

So confident is Prof. Burroughs that the tracks are real footprints that he has given the unknown animal a scientific name, *Phenanthropus mirabilis*. The name was suggested by Dr. Frank Thone, editor in biology of Science Service, with the concurrence of Mr. Gilmore. The first part of it translates as "looks human," and the second word simply means "remarkable."

Dissent is registered by David I. Bushnell, Jr., Smithsonian Institution ethnologist. Mr. Bushnell said, in a statement issued to the press, that every print he examined was undoubtedly an Indian carving. A prehistoric tribe or tribes, he believes, attached to them some symbolic meaning.

It is quite possible that the disagreement is more apparent than real. Unquestionably many, perhaps most, of the footprint-like marks in the rocks over a wide stretch of country were carved by human sculptors. Their artificial nature is manifest at a glance, especially when they are found paired, arranged in even rows, and accompanied by other symbols such as circles and three-pronged figures like great bird tracks.

It is quite as possible that other tracks are genuine footprints, especially when they are arranged quite at random, as the Berea tracks are, and where the prints vary greatly in size, as some of them do. It is this circumstance, in part, that has convinced Prof. Burroughs that the Berea markings are not artificial.

Dr. Alson Baker, a physician of Berea, recently wrote Science Service that he and Dr. A. F. Cornelius had made a critical examination of the tracks there, using a strong magnifier mounted on a tripod. He states:

"We examined the arrangement of the sand grains in the deepest portions of the prints, with especial attention to the heels. The sand grains in the bottoms of the prints were much more closely packed than those in the slopes, and those in the slopes were more closely packed than those in the rock an inch from the margins of the prints, or at any other point.

"Each member of the party certified and checked these findings and we all agree that the imprints were made by pressure when the sand was soft and wet.

"The fact that the sand grains in the bottoms and slopes of the imprints are of exactly the same kind as those in all other parts of the rock surface examined, seems to prove conclusively that the closer arrangement observed was not due to any possible drifting in of extraneous material."

Science News Letter, December 10, 1938

MATHEMATICS—AERONAUTICS

Mathematical Equations To Aid Stratosphere Flying

WITH pencil and paper John Sweer, expert of the U. S. Naval Research Laboratory, has just finished computations which will aid future stratosphere fliers traveling above 50,000-foot altitudes.

Mr. Sweer's calculations involve the bending experienced by a ray of light as it passes through the earth's atmosphere. This refraction, as it is called, must be determined and corrected for in all aerial navigation where "sights" are taken on the horizon and on a star to determine the latter's angular altitude.

Using a more general formula than previously employed, Mr. Sweer gives methods for computing the corrections for any altitude (*Journal, Optical Society of America,* September). Actually 100,000 feet is about the limit at which aerial navigators will need to worry about the bending, he explained.

Above 100,000 feet the atmosphere is so rarefied that further increase in altitude does not increase the amount of bending of the light rays.

The corrections which must be applied even at altitudes of 30,000 feet are quite large and amount, for this height, to 27 minutes of arc. Instrumental errors of a good sextant, by comparison, are only a half minute of arc.

The large corrections must be subtracted from the observations, Mr. Sweer points out, for the star on which the sight is taken is really lower than it appears to be.

The corrections overcome the fact that the earth appears to be flatter than it really is, when observed from great heights.

Back in 1919 a British scientist, A. R. McLeod, published corrections for altitudes of 50,000 feet. The new work of Mr. Sweer uses a more general formula and extends the correction range to 100,000 feet and above.

Science News Letter, December 10, 1938

PSYCHIATRY

Mass Mania

● "In all ages there have been abnormal psychological states afflicting society as a whole and urgently needing the psychological physician. The genuine Crusades brought in their train a series of migration manias which affected even children, and caused whole villages and towns to take leave of their homes and their common sense. Again, the Middle Ages produced wave after wave of dancing hysteria, in which masses of respectable citizens would dance themselves into complete exhaustion, and hence we get the unpleasant echo of 'St. Vitus dance'.

"Fashions in witchcraft followed; after which mass hysteria took on the more sedate form of Stock Exchange excitement . . . Today Europe groans under a nightmare emotion of war fever and suspicion; and no one knows how to alleviate the vicious psychological circle of fear and aggression." — Raymond B. Cattell in CROOKED PERSONALITIES IN CHILDHOOD AND AFTER (*Appleton-Century*).

Science News Letter, December 10, 1938

STARK POSITION FINDER

Capt. Horace Stark, inventor, with Pilots Sam Griesner and Murl Estes, examining the new device for determining position.

AERONAUTICS

Position Finders Developed To Tell Pilot Where He Is

Devices Take Complicated Figuring Out of Navigation By Translating Compass Bearings Into Map Location

ANOTHER of those air safety gadgets that make a pilot's cockpit as complicated as an income tax return but will make the plane as safe as a buggy ride and a lot more comfortable is being introduced to the industry.

It is the Stark Position Finder. It tells the pilot where he is and takes another element of complicated figuring and guesswork out of the science of flying. The first commercial models have been turned over to pilots of a leading airline at Washington Airport. A similar instrument has also just been developed by Glenn E. Markt of American Airlines.

Bearings

Invented by Capt. Horace Stark, Pennsylvania-Central Airlines pilot, the new instrument enables a pilot to translate radio compass bearings in a jiffy into his position on a map.

The position finder consists essentially of a translucent map representing on a circle eight inches in diameter territory 520 miles across—an area large enough to cover ground lying 250 miles each side of the airway along which the plane is supposed to be flying.

Below the map are two translucent screens ruled with spaced parallel lines. The three plates can be turned.

If the pilot wishes to note where he is, he takes a bearing on a given radio station by means of his radio compass. He then turns one ruled plate until the lines are pointed in the same direction as the radio station. He repeats the procedure taking a bearing on a different station and using the other ruled screen. The line on one plate which points to the radio station to which it is adjusted will intersect the corresponding line on the other plate at the point where the plane is located.

Science News Letter, December 10, 1938

AERONAUTICS

Automatic Position Finder Is Developed in England

AN experimental model of a position finder which automatically tells an airplane pilot where he is at a given moment with only a small error has been successfully demonstrated at Hamble, it is reported in London.

The device, still very much in the process of development, consists of a pair of automatic direction finders, each tuned to a different radio station. Each is linked to a needle swinging on a point representing the station to which it is tuned; hence each needle points toward the plane. The point where the needles cross is the point where the plane is located. The two needles are, of course, located on a map of the region over which the plane is traveling.

Successful development of this device will mark another of the major safety advances in aviation that seems promised by instruments demonstrated within the last few weeks. Not only would it be another insurance against being lost, but it would be useful in medium-sized transport and military planes which cannot carry a separate navigator.

Collaborating in the development are O. G. E. Roberts of the Straight Corporation and J. A. McGillivray, chief wireless instructor of Air Service Training.

Direction Finder

An automatic direction finder, an instrument distinct from the position finder, which in itself is a guarantee of not getting lost, has been independently developed and demonstrated in the United States by the Sperry Gyroscope Company and the Radio Corporation of America.

This new scheme merely takes two automatic direction finders and operates on the well-known principle that the lines from the plane to the stations must intersect at the plane. By superimposing the lines on a map, in the form of needles that respond continuously to changes in the plane's position, the pilot can be kept informed of where he is.

Refinements in construction of the direction finders and in other parts of the equipment may mean some day that much of the laborious work of calculating one's position will be unnecessary. It should also make ground speed determination, still one of the not-so-easy-to-figure aeronautical facts, easier to determine.

The present equipment is still subject

to certain errors, one of which probably can be eliminated, and the other of which is not a large error. The possibility of linking the device with the automatic pilot is also foreseen. Reports emphasize, however, that this model is only an experimental one and that conclusions as to its performance in production models, which are still a long way off, cannot yet be drawn. Its weight, now 100 pounds, can probably be reduced to 60 pounds.

Science News Letter, December 10, 1938

PUBLIC HEALTH

Health Hints For Tropic Vacations

THE TROPICS have become so popular with vacationists that Dr. George A. Skinner, professor of public health at the University of Nebraska Medical College, believes it is time to issue some health hints for tropic travellers. The Minnesota Public Health Association publishes them in its journal, *Everybody's Health,* just in time for snow-and-ice-bound northerners planning tropic cruises or other winter vacations to sunny lands. (November)

First thing to do when you plan your trip to the tropics is to be vaccinated against smallpox and typhoid fever. Dr. Skinner says "without exception" travellers should be protected by these two measures.

Milk, water, food and insects are health dangers to be considered particularly in the tropics or in any region where sanitary conditions are primitive. These may all carry the germs of dangerous, even fatal diseases.

Don't, Dr. Skinner warns, let the residents of the tropics persuade you to forego health precautions, or to believe that the milk and water are safe because they have been using them for years without being sick. A person long resident of a region where the milk is dirty and the water supply contaminated may use both and "get away with it" because he has built up a resistance to the germs they contain. The visitor is not so protected.

To be safe, milk and water should be boiled. So should cream for the coffee, because coffee at a temperature that can be drunk is not hot enough to kill the germs in milk or cream. Water for tooth-brushing also should be boiled, and don't put ice in the water unless it also is made from boiled, distilled or otherwise safe water. Ice cream and ices are another possible source of germs that are apt to be overlooked.

Raw fruits, vegetables and salads should also be avoided, except fruits like oranges and bananas that have a skin thick enough to keep out germs. Wash and peel these yourself, to be safe. Incidentally, don't forget to wash your hands before eating, because they are constantly touching infected things, Dr. Skinner warns.

Science News Letter, December 10, 1938

PUBLIC HEALTH

Health Service Fighting Dixie's Spreading Menace

NEW steps in the U. S. Public Health Service's fight against one of Dixie's serious health menaces, typhus fever, have just been announced. They consist of the discovery that the virus of typhus fever may find harborage in squirrels, rabbits, chipmunks and skunks as well as in rats, mice, woodchucks and opossums.

Addition of these new animals to the list of potential and actual animal reservoirs of typhus fever was made by Dr. George D. Brigham, assistant bacteriologist at the Federal Health Service's Typhus Research Laboratory in Mobile, Alabama.

For the first 46 weeks of this year 1,700 cases of typhus fever have been reported to the U. S. Public Health Service. Last year Georgia alone had over 1,000 and the total number probably ran as high as 3,000. The disease has spread not only in numbers of cases but in geographical directions as well. Texas, Alabama and Georgia are chiefly affected.

From two to four of every hundred cases of typhus fever end fatally. The disease is not the same as typhoid fever. Typhus fever used also to be called jail fever and ship's fever, because epidemics of it so often occurred in jails or ships. It was epidemic in Europe toward the close of the World War. The typhus fever we have in America is milder than the European variety and does not come in epidemics. Federal health officials have been trying to perfect a vaccine against typhus fever, but point out that the occurrence of the cases is too scattered for vaccination to be a very practical method of control.

War against rats is the method advised for fighting typhus fever, because these are the chief villains in the American typhus fever situation. Federal health officials have found the virus of the disease in these animals and proved that it was spread from rats to man by means of the rat flea. Dr. Brigham has been searching for other possible animal reservoirs of the typhus virus and found that he could inoculate the animals listed. Whether or not these actually provide harborage of the virus outside the laboratory is not yet known.

Science News Letter, December 10, 1938

MEDICINE

Blood Letting Used To Check Bleeding in Hemophilia

BLOOD letting is, paradoxically, being used with success as a treatment for bleeders.

Two Virginia physicians, Dr. George B. Lawson of Roanoke and Dr. A. B. Graybeal of Marion, Va., tell how they treated a man and two boys with hemophilia by the venesection method. (*Journal, American Medical Association,* Dec. 3)

One middle-aged patient has been bled every six or eight weeks for seven years, each time with almost immediate relief from all his symptoms.

Moreover, under the periodic blood letting regimen, he has had no internal hemorrhages for a number of years although they used to be frequent and often confined him to his bed for six weeks at a time.

It all began back in March, 1931, when the man became acutely ill with signs pointing to the presence of hemorrhage in the chest, abdomen and the

meninges (the membrane that envelops the brain).

Feeling that perhaps the hemorrhages were an effort of nature for relief, when everything else failed, Drs. Lawson and Graybeal tried venesection.

Within two days the man was mentally clear and physically in good shape. Now whenever he feels a fulness in the head or the joints, he comes to one of these two doctors and has about a pint of blood removed.

The two other cases reported are of boys 10 and 15, one with a family history of hemophilia and the other without such a history.

In all these venesections, Drs. Lawson and Graybeal use an aspirating needle in one of the veins of the arm. There has been no subsequent bleeding at the point of insertion.

In commenting on the three cases, the physicians say:

"Our studies suggest that in hemophilia there are other factors in the hemorrhagic condition besides the delayed coagulation time, such as an increased volume of blood or more fragile capillaries, and it is possible that extravasation in the tissues may tend to increase hemorrhage."

In the Lawson-Graybeal cases venesection has been used only at the time of a bleeding crisis.

Whether the treatment would be of value in cases in which there is a lacerated wound, such as occurs when a tooth is pulled or a finger mashed, they are not yet ready to say.

Science News Letter, December 10, 1938

SEISMOLOGY

Earthquake Observatory Established in California

A NEW seismological observatory has been established by the University of California, in the town of Mineral, which is situated in Lassen National Park, near the only active volcano in the United States proper. This is the seventh station for the study of earthquakes to be established in the state by the University.

Setting up instruments at Mineral does not mean that seismologists expect renewal of volcanic activity on the part of Lassen peak, it was explained, but only that a station was needed in this part of the state, and that its work can be facilitated by the presence of scientists of the National Park Service in the region, together with the cooperation of the Seismological Society of America.

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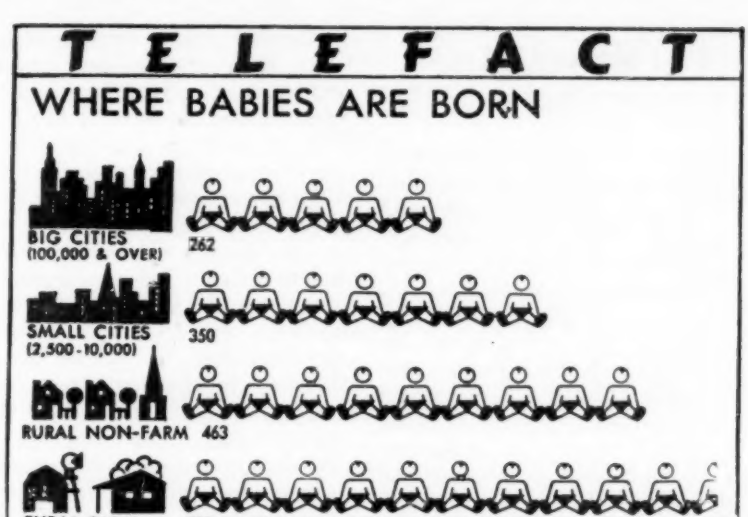

EASY TO READ

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BACTERIOLOGY

Bacteria Turn Wood Sugars Into Valuable Chemicals

Butyl Alcohol Is Principal Product; Lesser Amounts Of Ethyl Alcohol and Acetone Were Also Obtained

CHEMISTS at the University of Wisconsin are now using bacteria to turn sugar, made from wood, into valuable chemicals.

Butyl and ethyl alcohol, acetone and isopropyl alcohol are among the chemicals which have been produced experimentally by the fermentation of wood sugars.

Sugars from trees like hemlock, beech, maple and birch are no new thing, for in Germany there has been much research on the problem and two methods—those of Bergius and Scholler—are in commercial production.

Wood Sugar Obtained

In the Scholler process dilute sulfuric acid is percolated through shredded wood under pressure at high temperature and a dilute solution of wood sugar is obtained.

N. O. Sjolander, A. F. Langlykke and W. H. Peterson of the chemistry department at the University are using similar dilute sugar solutions as the starting point of their fermentation process. (*Industrial and Engineering Chemistry, Industrial Edition,* November)

The find that the butyl anaerobes *Clostridium felsineum* and *Cl. Butylicum* are able to ferment wood sugar solutions having a concentration up to five per cent. almost completely.

The first of these microorganisms, *Cl. felsineum,* gives the same distribution of products produced by fermentation as did common sugar, glucose, when it is fermented. Butyl alcohol was the principal product. Lesser amounts of ethyl alcohol and acetone were obtained.

The other organism, *Cl. butylicum,* produces these same chemicals out of the wood sugar but, in addition, it creates considerable amounts of isopropyl alcohol. In fact, the organisms produce more of this chemical from wood sugar than they can from glucose.

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The Red Cross is now training skiing enthusiasts and ski patrols in expert methods of handling people injured in winter sports.

PUBLIC HEALTH

Birds, Not Horses, May Spread New Disease

MIGRATORY birds, not horses, may be the means of distributing so-called horse sleeping sickness, widespread ailment recently discovered to have killed several children and suspected of being fairly widespread among humans as well as horses.

The discovery of the virus of the disease in the brains of pheasants that died after a paralyzing ailment is reported by Drs. Ernest Edward Tyzzer, Andrew Watson Sellards and Byron L. Bennett, of the Harvard Schools of Medicine and Public Health. In their report (*Science* Nov. 25) the Harvard scientists state that the pheasants were sent them for diagnosis by Edward H. Mulliken of Connecticut who found them in "a more or less helpless or partially paralyzed condition."

It is probably wrong to call this ailment a "horse" or "equine" disease, the Harvard scientists suggest in the light of recent findings.

"Indeed, it may be seriously questioned," they state, "whether the horse or any other domestic animals play any essential role in assuring the perpetuation of this disease."

From their findings and those of other scientists it looks as if the ailment were a bird ailment which at times overflows to the horse and human populations. Laboratory tests by other scientists have shown that migratory birds can get the disease. The Harvard scientists say that extensive surveys should be made to determine whether migratory birds have the ailment under natural as well as laboratory conditions, and if so, how widespread the disease is among such birds.

Science News Letter, December 10, 1938

CHEMISTRY

Silica and Boron Match Carbon's Ring Structure

THE versatility of carbon is proverbial among all the elements found in nature. Carbon's Dr. Jekyll and Mr. Hyde ability to combine with itself in two ways—either in rings or in chains—accounts for its creation of hundreds of thousands of chemical compounds.

Arranged in chains, carbon makes possible petroleum, rubber, fats, the natural oils and the solvents. When the chains are turned around and form a ring, the chemicals typified by dyes, explosives, drugs and the synthetic resins result.

Chemists have long sought to make other elements duplicate the unusual and extremely valuable type of bonding which carbon can achieve. The Industrial Bulletin of Arthur D. Little Inc., reports that they are gaining their goal in this respect; at least in some cases.

The best success has come with elements, like silicon, which are closest to carbon in chemical characteristics. Silicon, like carbon, has the ability to join up with four hydrogen atoms in a molecule. And, like carbon also, it has the power to form compounds with itself known as silanes. These silanes are analogous to the carbon compounds, methane and ethane, found in natural gas.

Boron too, is another element which can form compounds with its own atoms. Boranes may have as many as ten boron atoms linked in a chain. Both silanes and boranes ignite in air, sometimes with violent explosions.

By joining nitrogen and boron, chemists have succeeded in making a ring compound which is extraordinarily like benzene. In fact, the compound is called inorganic benzene.

It has practical significance in that, like real benzene, it is a liquid and a solvent for oils and fats. While it is not all that one desires even as a benzene analogue it may be a step on the way to improvements that will have important industrial applications. German chemists have been working in this field and it is comforting to note that American chemists, too, are studying the reactions.

Science News Letter, December 10, 1938

ASTRONOMY

Urges Naming Observatory After Dr. George E. Hale

NAMING the California Institute of Technology observatory on Palomar Mountain, site of the 200-inch telescope, in honor of the late Dr. George Ellery Hale, world renowned astronomer, is being considered seriously.

Dr. Hale's name will form the permanent name for the observatory, hopes Capt. Clyde S. McDowell, supervising engineer, who held it only just that the man who envisioned the giant project be so honored.

Capt. McDowell said that no formal action as to the selection of a name has been taken, however.

At the time of his death Dr. Hale was in charge of the observatory enterprise, and wrote the magazine article which resulted in the project's endowment.

Science News Letter, December 10, 1938

IN SCIENC

PHYSICS—PHOTOGRAPHY

Camera Shows Glass Cracks At Mile a Second Speed

See Front Cover

THE stop-action camera of Prof. Harold E. Edgerton and Frederick E. Barstow, of Massachusetts Institute of Technology, shows that when glass breaks, it cracks at a speed of nearly a mile a second.

The illustration on the front cover of this week's SCIENCE NEWS LETTER shows what happened to a piece of tempered glass at the moment that it was struck by a metal plunger, the dark spot at the center of the picture.

The pattern of the cracks forms a perfect circle, visual proof that all the cracks grow at the same velocity.

Science News Letter, December 10, 1938

PHYSICS

Air-Conditioning Increases Ionization of Atmosphere

AIR in an air-conditioned building contains twice as many ions as air out in the open, a study reported in *Nature* (Nov. 26) indicates.

Besides increasing the number of ions, the balance between positive and negatively charged particles in the atmosphere is changed, the report, prepared by F. Behounek of the State Radiological Institute of Prague and J. Kletschka of the Prague Municipal Electric Works, declares.

Though no study as to what this does to people working in such an atmosphere has been undertaken, "permanently increased ionization of air in an air-conditioned building may have a certain physiological influence," the scientists indicate.

Open air contains 300 positive ions per cubic centimeter and 260 negative ions, while air in the middle of an air-conditioned room contains 775 positive ions and 895 negative ions per c. c., the two scientists have learned.

The number of negative ions within the air-conditioning apparatus is much higher, they point out, but the bulk of these are absorbed by the walls, thus almost restoring the balance.

Science News Letter, December 10, 1938

NCE FIELDS

EMBRYOLOGY

World's Youngest Human And Monkey Babies Studied

THE world's smallest and youngest baby, almost nine months before birth, and the smallest and youngest monkey, too small to be seen by the unaided eye, were described by Dr. George L. Streeter of the Carnegie Institution of Washington in a lecture at the Institution.

This littlest human creature is a fertilized egg less than 13 days old. The youngest monkey is an 8-day-old egg, 24 hours younger than any previously discovered.

This 8-day-old youngster has arrived at the stage which completes the first and most fundamental chapter in the development of the egg, Dr. Streeter and associates discovered.

Science News Letter, December 10, 1938

PUBLIC HEALTH

New Zealand Provides Lesson On Saving Infants

FROM the other side of the world comes an object lesson for Americans on how to save infants' lives.

New Zealand, a country which is much like ours in habits, customs and general constitution of the population, is 25 years ahead of us in protecting the lives of new babies, Metropolitan Life Insurance Company statisticians point out in a comparison of the infant mortality rates of the two countries.

"Approximately two of every five deaths of white infants in the United States are unnecessary and preventable, according to the standards of New Zealand, the country with the lowest infant mortality in the world," the statistical report states. "In other words, we could save about 30,000 lives a year if we were as efficient as New Zealand is in thwarting infant mortality."

A few American cities have as low an infant mortality rate as New Zealand, but for the country as a whole the rate for white infants is 60 per cent. higher than the rate for New Zealand.

The only point on which we approach New Zealand is, strangely enough, in the death rate for a group of conditions which are particularly hard to control. These are congenital malformations and debility and diseases peculiar to early infancy. Death rates for these causes are practically the same in the United States as in New Zealand and in four states —Minnesota, Nebraska, New Jersey and New York—are actually lower.

Deaths from injuries at birth and deaths arising in connection with premature birth, essentially preventable causes of deaths, are consistently higher in America than in New Zealand.

The infant death rate for diseases of the digestive system is almost five times that of New Zealand and the death rate for communicable diseases of childhood and respiratory diseases (pneumonia, for example) is twice that of New Zealand.

Science News Letter, December 10, 1938

PALEONTOLOGY

Mastodon Bones and Teeth Are Discovered in Ohio

A MASTODON's thighbone and eight teeth have been discovered on an Ohio farm, Prof. Karl Ver Steeg of the College of Wooster reports (*Science,* Nov. 25). The largest of the teeth weighs a little more than six pounds.

J. J. Miller, the landowner, made the find while digging a ditch. When the bones were taken out, it was found that the skeleton had been partly destroyed by an explosive blast set off in the same excavation site about ten years ago.

Science News Letter, December 10, 1938

BOTANY

Posthumous Report Shows That Pollen Grains Fly High

A POSTHUMOUS report from Dr. Fred C. Meier, Department of Agriculture scientist who was aboard the ill-fated Hawaii Clipper carrying out his researches when the flying boat disappeared, shows that airplanes aren't the only things that fly high. Pollen grains do, too, including sugar beet pollen grains.

The report, published by Dr. Meier and Dr. Ernst Artschwager, also of the Department of Agriculture, (*Science,* Nov. 25) states that sugar beet pollen grains were captured on specially prepared sticky plates at altitudes up to 5,000 feet, over an area in New Mexico where sugar beet seed is raised for market.

Science News Letter, December 10, 1938

PSYCHOLOGY—SOCIOLOGY

Five Brothers in Crime Subject for Research

CRIME is costing America a vast amount in damage to property, loss of life, expense of administering justice and in the toll of racketeers. Even greater is the waste of human resources diverted from creative usefulness into ways of destruction and parasitism.

In a single family five brothers who passed from a childhood of juvenile delinquency into criminal careers have cost society more than $25,000 just for board alone in the various institutions where they have spent a total of 55 years.

And yet the reason for this particular bill against society is found right in the social conditions under which these five brothers made their start in life.

At the Institute for Juvenile Research in Chicago, Dr. Clifford R. Shaw made a scientific study of this family in crime. Criminal records were examined, family history was dug into. Individuals were interviewed. Finally, autobiographies were secured—human, frank documents telling how a boy goes wrong. In this work he was assisted by Drs. Henry D. McKay, James F. McDonald, Harold B. Hanson and Ernest W. Burgess; their findings are published in the book, *Brothers in Crime.* (University of Chicago)

The parents of these criminal brothers were not outcasts. But the father drank and the mother had to work to feed the children who were thus left to care for themselves.

First they begged—they were hungry and others were hungry at home. Their hard luck story found easy believers because it was actually true.

The next step was "junking." This meant picking up old metal and odds and ends to sell. At first they collected from dumps and vacant lots, then from deserted shacks, then from vacant houses, finally from occupied houses and automobiles. The progression from junking to larceny and burglary was an easy one that did not burden their untutored consciences.

These early beginnings were followed by institutional training in crime with hardened experts as instructors in new techniques of law breaking.

None of the five seemed to be bad at heart. He might have gone straight at any time had the path been easier and had he not been returned from correction institutions to the same bad environment and bad companions.

Science News Letter, December 10, 1938

ETHNOLOGY—PSYCHOLOGY

Suffering Seven Millions

Of 16,000,000 Jews, Between 9,000,000 and 10,000,000 Are Free From Persecution; They Are Not a True Race

By DR. FRANK THONE

FROM all the shouting and tumult that preceded the present super-pogrom in the German Reich, one might have concluded that the Jews in Germany swarmed everywhere, thicker than they do on New York's East Side, ready to overwhelm the land with their millions. As a matter of sober statistics, however, the 750,000 Jews within the Reich's present boundaries constitute only a trifle more than one per cent. of the total population!

Where are the Jews of the world, the sixteen and a quarter millions of Israel's ancient faith estimated by the Jewish Scientific Institute of Warsaw? How many of them even now cower under the spreading cloud of the Nazi example, in other lands of persecution? How many of them can still walk freely in the world's areas of toleration?

Figures given by the Institute, together with others from the American Jewish Committee, indicate that of the 16,000,000-odd Jews, about two-thirds live in lands where their lot is as tolerable as that of other citizens or subjects, while the remaining third are either suffering from persecution now or may become victims of the "Judenhetze" in the not distant future.

Foremost in the list of lands of tolerance is the United States, where the largest single national block of Jewish population finds a home. There are about 4,500,000 Jews in this country, more than half of them living in and near New York City. This is well over a fourth of all the Jews in the world, and includes nearly all members of the race in the Western Hemisphere.

Russia Second

Jews of the USSR come next in number—3,080,000 of them. They have the same rights and privileges as all other Soviet citizens. Of course the Jewish faith, like all other religions in Russia, is attacked by organized propaganda under quasi-official sponsorship.

This warfare of ideas, however, cannot be considered discrimination in the ordinary sense, since Jews as such are not subjected to special economic disabilities or to physical violence.

Jewish population concentrations in the two great democracies of western Europe are even lower than they are in Germany: 720,000 in the entire British Empire, 220,000 in France. The smaller democracies—Switzerland, the Low Countries, the Baltic states—together account for about a quarter of a million Jews. Scattered about the world, a few thousands or even only hundreds in each land, are a total of perhaps another million Jewish people.

Palestine might just now be reckoned as an area of persecution rather than of tolerance for its 175,000 Jews; but the Jews there face their opponents with weapons in their hands, and an armed man, even though he perish, does not feel that he is being persecuted so long as he can fight.

All told, the "free" Jews count up to between nine and ten million souls.

The world's regions of anti-Semitic persecution must be considered to include not only the lands where pogroms are aflame today but also where they may break out tomorrow through imitative spread, or where unhappy past record indicates that the fire of racial hate has smouldered and glowed, low but undying, for many generations.

Poland Has Many

Such lands are Poland, with more than three million Jews, Rumania, with a little less than one million, and Hungary, with something under half a million. Unhappy Czechoslovakia, now under Nazi domination, must be placed among the "persecution" states, to the misfortune of 357,000 Jews, and probably the Balkan states other than Rumania are more or less intolerant of the Jews who sum up to 186,000 for all of them.

Whether the German example will be followed to its full extreme in some of these states may be questioned, unless mob psychology drives reason completely out of their chancelleries. The Jewish fraction of the population is much larger in Poland (10 per cent.) and in Hungary and Rumania (5 per cent. each). To ruin that large a percentage of any country's total population is economic suicide.

Italy's loudly trumpeted conversion to anti-Semitism looks a bit silly when it is seen that among the kingdom's 45 million population there are only 47,000 Jews. Il Duce's decision to pester his Jews must have been based on something besides economic and race-statistical considerations.

Even more grotesque appears the hopefully budding anti-Semitism that some extremists are promoting in Japan. In Japan proper, a country of 70 million people, there are not more than 1,000 Jews!

What is this Jewish race, that the Nazi leaders hate so much they are willing to incur the enmity of the whole world in order to suppress it?

No "Typical Jew"

Scientific anthropology has no answer. There isn't such a thing as a "typical" or "full-blooded" Jew: He is even rarer than that mythical blond animal, the "true" Nordic. The Jew as he stands before us today, far from being a "race" in any scientifically intelligible sense of the word, is about the most thoroughly mixed product of history's melting-pot that the world affords.

Consider his history. The Jew first appeared over the horizon as a small nomadic tribe, speaking a Semitic language. He settled in Palestine, and immediately intermarried with the peoples already there, some of them Semitic, some not. He migrated to Egypt, and after several centuries migrated out again, by now a numerous folk who in the course of a few more centuries completely reconquered the old home in Palestine and founded a kingdom there.

He married the widows and daughters of his late enemies, and his kings took unto themselves in rather wholesale fashion the sisters and daughters of their neighboring monarchs. Conquered and taken into Babylonian exile, a large part of the people disappeared; descendants of the rest brought additional admixtures with them when they returned to rebuild the Temple.

Overrun by the Greeks under Alexander, then by the Romans, finally blotted out as a political entity and scattered to the ends of the earth as a people, the Jews have persisted amazingly for 2,000

"JEWISH" NOSE

But this is no Jew. He is a Hittite King and the Hittites were Indogermanic people.

years. As a race? Hardly. As a culture built around a religion, yes. But long before they were scattered like wind-blown seed over the world, and certainly increasingly so since, the Jews have been a mixed race.

In their present European distribution, the Jews of any given country or region are physically more like the Gentiles of that region than they are like the Jews of some place farther away. A German Jew is more like a German Christian in the shape of his head and his complexion than he is like a Jew of Portugal or Spain.

As extreme cases might be cited the small colonies of Jews in China and Africa, isolated for many centuries after the wave of Jewish missionary effort about the beginning of the present era. These people are Jews, without question, and are so regarded by themselves and their neighbors. But the Jews of China are Chinese by any possible standard of racial determination, and the Jews of Africa are as definitely Negroes.

Imaginary "Race"

The Jewish "race" is a type that people have set up in their own minds. If a man has dark eyes, dark, curly hair, swarthy or olive complexion, and above all if he has a prominent nose, we think of him as "typically Jewish"; if he doesn't look like that we may say he "doesn't look like a Jew"—though he may trace his lineage back without a break to Abraham.

There have been many jokes made about the Jewish nose, but the nose itself is the biggest joke of all—on the jokesters. For it is not a part of the original Semitic facial equipment, but a Hittite contribution—and the Hittites were an Indogermanic people!

Science News Letter, December 10, 1938

PSYCHOLOGY

Persecution Is Seen As Move Against All Religion

By MARJORIE VAN DE WATER

IT IS no mere coincidence that the frenzied attacks on Jews are accompanied by violence toward Catholic clergy in Vienna and in Germany.

The psychiatrist sees in these outbreaks manifestations of a group mental disorder—the reflection of a neurotic condition in thousands of individuals. The attack is not so much racial as it is anti-religious. It involves not just Jews but Catholics and eventually all religious peoples. For it is a way of attempting, through mob violence, to destroy the natural religious feelings of the attackers themselves.

The German ruling group wishes to substitute for religion a zealous love of country, pride of race and ideals of courage and military virtues. The attempt is not likely to be successful, because of the inner conflict nature provides in every man between his desires for happiness and worldly well-being

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and his need for a higher spiritual life of love, worship and self-sacrifice. Among men who have been unable to find an adult solution to this inner conflict—who have never discovered how to "render unto Caesar the things that are Caesar's and unto God the things that are God's" a powerful need to still the voice of conscience results in mass attacks upon all existing religions.

But beyond the need for destroying religion is the need for a scapegoat.

When men are hungry, when they are bound on every side by laws and rules and military discipline, when "verboten" signs obstruct every desire for freedom of speech and movement, and when their futures hold no promise of security, then are built up tremendous forces of hate, resentment, and aggression.

Such feelings of hostility must find an outlet just as mountain torrents must break through the strongest dams. Forces of hate can be diverted from one object to another; if an angry man cannot punch the bully who insults him he will kick his own dog.

Usually some weak group is the victim, the scapegoat in such a situation. Any sort of minority group might be thus picked upon, but in Germany today the Jew serves two purposes. As a scapegoat, he allows the hate-filled suppressed masses to vent their warring spirit; as a symbol of religion he permits them to attempt to annihilate all conscience.

The rulers of a totalitarian state in which individual freedom is severely restricted must encourage such outbreaks or else the destroying forces of antagonism will turn on the dictators themselves. If the angry man is not permitted to kick the dog he will at last be driven to shoot the bully.

Hitler must have war. The present outbreaks may serve temporarily as an outlet for the anger of German mobs, but eventually they must face an enemy or they will destroy the intolerable conditions that are creating such hostility.

It is impossible to overlook in Hitler's provocative actions and speeches the purpose, conscious or unconscious, of goading the United States and Great Britain into war.

Here again the Jew serves a purpose, for it is understood that Jewish protests against such incredible persecution will have a profound influence in both England and America.

Science News Letter, December 10, 1938

MEDICINE

Sex Gland Hormones Seem to Influence Cancer Resistance

One Hormone Stimulated Tumor Growth in Male Mice, Another in Females, Two More Inhibited Their Growth

THE probability that hormones secreted by the sex glands can influence the susceptibility of resistance to the growth of a transplanted cancer of the ovary in mice is reported by four members of the Department of Anatomy of the Yale Medical School (*Genetics*, November) Drs. L. C. Strong, R. T. Hill, C. A. Pfeiffer and W. U. Gardner demonstrated this influence by tests involving several hundred mice in which the genetic constitution had been stabilized by generations of brother-sister breeding.

The ovarian carcinoma studied was maintained for three years by generation-to-generation transplantations in a genetically known strain of mice. All the males tested grew large tumors soon after receiving the cancerous tissue, but the females developed tumors, at a much slower rate than the males, only in a limited number of cases. This same sex difference was observed when the strain was outcrossed to another of different genetic background. Hence it is believed that a non-genic, sex-limited factor determines the difference in response between males and females identical in their heredity.

Further crosses, however, indicated that the actual susceptibility within one sex is determined by four heritable factors, or true genes, which act in accordance with the Mendelian laws of inheritance.

That hormones might affect the response of the individual to the inoculated cancer was suggested by the fact that castrated male mice of the susceptible strain only occasionally grew the tumors, and then at a much slower rate than did the males in which the sex glands were retained.

Hormones derived from the sex glands or from the serum of pregnant animals were accordingly injected into inoculated mice. One of the hormones stimulated tumor growth in the males, another in the females, and two more inhibited the growth of the implanted cancer. Since these effects were never observed in castrated individuals, it seems that the action of the injected hormones is on the sex glands of the host.

These data show, according to the authors, that hormone therapy can make up for defects or variations in the inherited system that determines the response of a mouse to an inoculation of cancerous ovarian tissue.

Science News Letter, December 10, 1938

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BOTANY

NATURE RAMBLINGS

by Frank Thone

Monument in Grass

GRASSES, it might be safely asserted, are the most important of all plants so far as mankind is concerned. The grains he eats, the pastures for his cattle, the lawns and links he plays on, even the bamboos and thatch for some types of houses, represent only a few of the manifold uses of grass. Grass roots bind his soil against erosion; negatively, grasses are sometimes weeds.

It is not remarkable therefore that some botanists devote distinguished lifetimes to the study of grasses, wild and tame. One such, Dr. Albert S. Hitchcock, died some time ago, and his special library on grasses, most notable collection of its kind in the world, is now in process of being catalogued at the Smithsonian Institution, in which he worked for many years and to which he willed his approximately 6,000 books and pamphlets on the world's grasses.

In the course of his long working lifetime, Dr. Hitchcock contributed very materially to the building up of the immense collection of grasses in the U. S. National Herbarium. Nearly a quarter of a million sheets of grass specimens, duly mounted, identified and labeled, constitute the largest grass collection in the world and make the National Herbarium the Mecca of grass specialists.

Characteristic of Dr. Hitchcock's devotion to his science and to the interests of the National Herbarium was his action in putting up funds of his own for the purchase of a large private collection containing many important original or "type" specimens, which might otherwise have been sold abroad. His money remained tied up for eight years before the government got round to taking the collection over, at exactly the same sum he had paid for it.

Science News Letter, December 10, 1938

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The Woman Asks the Doctor . . $1.50

By EMIL NOVAK

Every woman picks up information—usually misinformation, if it comes by the grapevine route. And misinformation or no information may make the difference between well-being and wretchedness, even life and death. Literally millions of women are suffering today real agonies as a result of nothing more tangible than superstitions; short of that, are suffering inhibitions and inconveniences and mental *non*-hygiene because of mistaken ideas valiantly clung to, and handed down from mother to daughter.

Some symptoms related to feminine functions loom large but are really of little genuine importance, it so happens. Which ones? Some, again, are passed by lightly which are warnings of real danger. Which ones?

So far as we know, there is not another book of this sort, though there are many books for women on subjects of far less moment to them.

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Ghosts I Have Talked With . . . $2.00

By HENRY C. McCOMAS

Margery didn't fool him

Doctor McComas, an experienced psychologist, has for many years taken a personal interest in the study of mediums and their methods. Because of his unusual success he was appointed official investigator for the Society for Psychical Research and was associated in the investigation of many famous cases such as that of Margery, the famous medium of Boston.

Looks tough for Sir Arthur Conan Doyle

In this book he relates his many experiences and reveals the results of careful scientific observations of alleged supernatural manifestations which have baffled many thousands of people. He explains why many, even highly intelligent ones, are misled into belief in a medium's power. He gives detailed descriptions of many séances that would make the ordinary individual's hair stand on end. Then comes the dénouement; no secrets remain after he explains just how the apparent phenomena are accomplished.

Science and Seances

Truly a ghost-story book with plenty of thrill; but with the final satisfaction of letting the reader in on the answers. It is a book that is really informative, as well as downright entertaining.

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PALEONTOLOGY

Newly Found Bones Indicate That Ape Walked Like a Man

Toe Bone Is Longer Than That of a Man But Belonged To a Foot Used To Upright Walking; Arm Bones Confirm

By E. N. FALLAIZE
Fellow, Royal Anthropological Institute of London

THREE broken pieces of bone, newly found at Kromdraai in South Africa, give strong evidence that the extinct anthropoid ape Paranthropus walked on two legs like a man. The discoverer, Dr. Robert Broom of the Transvaal Museum at Pretoria, reports his find in *Nature* (Dec. 3).

The three bone fragments, which Dr. Broom states almost certainly belong to Paranthropus, are the lower end of a right humerus (the elbow), the lower end of one of the bones of the right arm, and a bone of a toe. So nearly human are these three bones, that Dr. Broom says that they are almost indistinguishable from those of a man. They are quite unlike the corresponding bones in either chimpanzee or gorilla. But as Dr. Broom, in sorting over between three and four thousand bones which have been collected from the Kromdraai site, has not found a single bone or tooth belonging to man, and the bones now found were quite close to the place where the skull lay, he feels justified in attributing them to Paranthropus.

The great importance of this discovery, however, does not lie merely in the close resemblance of these bones to those of man. Not only do they confirm Dr. Broom's conclusion from the conformation of certain bones of the skull, that this man-like fossil walked upright when he was alive, but they extend it.

The toe bone is a little longer than that of man, but it belonged to a foot which was habituated to upright walking, while the humerus reveals that the upper limbs were not used for locomotion. Hence the upper limbs of Paranthropus were freed for that development of the use of arm and hand which led to the specifically human activity of tool-making, as well as tool-using, this activity in its turn helping on the development of the distinctively human characters of the brain.

The discovery of part of the thighbone of the Sterkfontein fossil, to which Dr. Broom has given the name Plesianthropus, on account of its resemblance to man, indicates that this anthropoid also probably walked upright.

A further discovery at Sterkfontein is that of the brain cast of what, it is believed, must have been a male skull of Plesianthropus. It is considerably larger than the brain cast made from the type skull which was found at Sterkfontein, and is believed to be that of a female. The new brain cast has a capacity of from 600 to 650 cubic centimers.

The new skull of *Pithecanthropus erectus*, the ape-man of Java, which was found recently, has a capacity of 750 c. c., so that Dr. Broom's Sterkfontein brain cast comes very close to that of a skull which is regarded definitely as coming within the human line.

On the evidence of the fossil teeth of horse which have been found on the Kromdraai site, Dr. Broom now thinks that the Kromdraai skull may be considerably older than was at first estimated, and possibly belongs to the Middle period of the Pleistocene, or Ice Age.

Science News Letter, December 10, 1938

During the World War, mice in Australia got into wheat stores and multiplied in epidemic numbers, so that 70,000 mice were killed in one wheat yard alone in an afternoon.

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The American Journal of Anatomy
The Anatomical Record
The Journal of Experimental Zoology
American Journal of Physical Anthropology
Journal of Cellular and Comparative Physiology
The Journal of Nutrition
American Anatomical Memoirs
Publications of the Biological Survey of the Mount Desert Region

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● Earth Trembles

Information collected by Science Service from seismological observatories and relayed to the U. S. Coast and Geodetic Survey resulted in the location of the following preliminary epicenter:

Wednesday, November 30, 11:29.8 a. m., Japan Time

Off east coast of Japan. Latitude 37 degrees north, longitude 132 degrees east.

For stations cooperating with Science Service in reporting earthquakes recorded on their seismographs see SNL May 21.

•First Glances at New Books

Additional Reviews On Page 384

Physiology

BIOGRAPHY OF THE UNBORN — Margaret Shea Gilbert—*Williams and Wilkins,* 132 p., $1.75. This book tells the story of the development of the human infant from fertilization to birth, with an extra chapter on twins, variations and malformations. It is accurate, authentic, not very long and has a glossary of scientific terms and numerous diagrammatic illustrations, but it is weighty with physiological terms and details and seems far beyond the comprehension and interest of the average lay reader.

Science News Letter, December 10, 1938

Education—Sociology

THE NATIONAL YOUTH ADMINISTRATION—Palmer O. Johnson and Oswald L. Harvey—*Govt. Print. Off.,* 121 p., 15 c. A report by the President's Advisory Committee on Education.

Science News Letter, December 10, 1938

Science

TRANSACTIONS OF THE WISCONSIN ACADEMY OF SCIENCES, ARTS AND LETTERS, VOL. XXXI—Wisconsin Academy of Sciences, Arts and Letters, 570 p., illus., $4.

Science News Letter, December 10, 1938

Anthropology

A BRIEF HISTORY OF NAVAJO SILVERSMITHING—Arthur Woodward—*Northern Arizona Society of Science and Art,* 78 p., illus., $1.85. With Indian jewelry gaining popularity in American shops, this little book that explains the Navajo silver designs and techniques should interest many readers. It has a long bibliography, for those who wish to read more on the subject.

Science News Letter, December 10, 1938

Geography—History

HISPANIC CIVILIZATION — Walter J. Muller—*Globe,* 122 p., 80 c. Intended primarily as additional study material for students of Spanish language, this small book is crammed with facts about old Spain and the imprint of its civilization on America. Those interested in Spanish-American countries will find much reference information in this little handbook.

Science News Letter, December 10, 1938

Anthropology

THE INDIAN COSTUME BOOK—Julia M. Seton—*Seton Village Press, Santa Fe,* 220 p., illus., $3.50. Attractively bound in wood and leather and containing many drawings and photographs, this is a good reference book for those who want general information. It should be especially helpful in designing sets and costumes for Indian drama, and a short bibliography of Indian plays and pageants is provided for this type of reader.

Science News Letter, December 10, 1938

Radio

THE RADIO AMATEUR'S HANDBOOK (16th ed.) — *American Radio Relay League,* 454 p., $1. Beginning with a statement of the amateur's code, this condensed volume is packed with practical information of immense value to each of the 50,000 "hams" who crowd the short wave bands of the United States and Canada. Construction, operation and other features are covered. It was prepared by the headquarters staff of the A. R. R. L.

Science News Letter, December 10, 1938

Botany

WILD FLOWERS OF OHIO—Harold L. Madison—*Cleveland Museum of Natural History,* 190 p., illus., $1.50. In this little book, 825 species are illustrated with small but clear line drawings and described with a few economically-worded sentences each. This book is the first of a series.

Science News Letter, December 10, 1938

Engineering

STEEL CONSTRUCTION (4th ed.)—Henry Jackson Burt and C. H. Sandberg—*American Tech. Soc.,* 438 p., illus., $3.50.

Science News Letter, December 10, 1938

Chemistry

BIOCHEMISTRY FOR MEDICAL, DENTAL AND COLLEGE STUDENTS—Benjamin Harrow—*Saunders,* 383 p., $3.75. Biochemistry as taught at the College of the City of New York. Each chapter contains additional references which include research reports in the literature through 1937.

Science News Letter, December 10, 1938

Engineering

ABOUT PETROLEUM—J. G. Crowther—*Oxford Univ. Press,* 181 p., $2.25. A layman's book by a British popularizer. The origins of petroleum, methods of finding it, transportation, refining and its use as a lubricant are all discussed.

Science News Letter, December 10, 1938

Chemistry

LABORATORY MANUAL TO ACCOMPANY INTRODUCTORY GENERAL CHEMISTRY (Rev. ed.)—Harold G. Dietrich and Erwin B. Kelsey—*Macmillan,* 118 p., $1.90.

Science News Letter, December 10, 1938

Physics

PROCEDURES IN EXPERIMENTAL PHYSICS—John Strong, H. Victor Neher, A. E. Whitford, C. Hawley Cartwright and C. Hayward—*Prentice-Hall,* 642 p., $5. Research physicists and chemists have been looking for this book for years. It contains all the tricks used in physical researches to attain high vacuum, operate the most sensitive of instruments, build amplifying circuits, and the other techniques which every good scientist ought to know. The illustrations by Roger Hayward are splendid, and theory and practice are correlated in the best possible fashion.

Science News Letter, December 10, 1938

Sociology

BROTHERS IN CRIME — Clifford R. Shaw, Henry D. McKay, James F. McDonald and others.—*Univ. of Chicago Press,* 364 p. See page 377.

Science News Letter, December 10, 1938

Education

HOW TO STUDY — Samuel Kahn — *Meador Pub. Co.,* 158 p., $2. A book intended as an aid to college students.

Science News Letter, December 10, 1938

Psychology

THE BEHAVIOR OF ORGANISMS—B. F. Skinner—*Appleton-Century,* 456 p., $5. A technical book which will be of great interest to physiologists and psychologists.

Science News Letter, December 10, 1938

Anthropology

DIRTY BOY: A JICARILLA TALE OF RAID AND WAR—Morris Edward Opler —Amer. Anthropological Assn., 80 p., 85 c.

Science News Letter, December 10, 1938

Zoology

THE NAIAD FAUNA OF THE HURON RIVER, IN SOUTHEASTERN MICHIGAN—Henry van der Schalie—*Univ. of Michigan Press,* 83 p., figures, plates and maps, $1.

Science News Letter, December 10, 1938

Geology

SOME ARIZONA ORE DEPOSITS—Arizona Bureau of Mines—*Univ. of Arizona,* 136 p., 40 plates, 12 figures, 35 c.

Science News Letter, December 10, 1938

Economics

REPORT OF THE COMMITTEE ON PRICES IN THE BITUMINOUS COAL INDUSTRY, PREPARED FOR THE CONFERENCE ON PRICE RESEARCH — *National Bureau of Economic Research,* 144 p., $1.25.

Science News Letter, December 10, 1938

•First Glances at New Books

Additional Reviews On Page 383

Geology—Archaeology

TEN YEARS UNDER THE EARTH—Norbert Casteret; Trans. and ed. by Barrows Mussey—*Greystone,* 283 p., illus., $3. This book tells the first-hand story of an athletic French explorer and his hardy wife, who have spent years of exciting, often perilous, always hard work in the Pyrenean caverns where men of the Old Stone Age hunted cave bears and wrought the world's first art. This work has received the coronation of the French Academy.

Science News Letter, December 10, 1938

Medicine

THE MARCH OF MEDICINE—Ray Lyman Wilbur—*Stanford Univ. Press,* 280 p., $2.75. Medical and health problems of, roughly, the last quarter-century, including the ever-present problem of medical economics are discussed in this volume which is made up of speeches delivered by the author on various occasions since 1913.

Science News Letter, December 10, 1938

Forestry

SAGAS OF THE EVERGREENS—Frank H. Lamb—*Norton,* 364 p., illus., $3.50. This book ranges the world to make us acquainted with the world of the conifers: familiar fir and spruce and pine, through sequoia and cypress to far-away deodar, ginkgo, araucaria and kauri; all who love dark-green stateliness will find fascination in these pages and pictures.

Science News Letter, December 10, 1938

Geography

OUR AMERICAN TROPICS—John E. Jennings, Jr.—*Crowell,* 265 p., $2.50. South Florida, Puerto Rico, and the Virgin Islands are here attractively presented to the prospective tourist. A good book to read when winter is closing in—particularly if you expect to be able to travel.

Science News Letter, December 10, 1938

Botany

FLORA OF PERU—J. Francis Macbride—*Field Museum of Natural History,* 1136 p., $2.50. A new and noteworthy addition to the valuable list of floras of Central and South American countries being produced by the Field Museum. Of value to professional botanists.

Science News Letter, December 10, 1938

Geology—Physics

TRANSACTIONS OF THE AMERICAN GEOPHYSICAL UNION, NINETEENTH ANNUAL MEETING, APRIL 27 TO 30, 1938, WASHINGTON, D. C.; PART I: Reports and Papers, Washington, D. C., General Assembly and Sections of Geodesy, Seismology, Meteorology, Terrestrial Magnetism and Electricity, Oceanography, Volcanology, and Hydrology, 585 p., $3.50. PART II: Reports and Papers, Section of Hydrology and Western Interstate Snow-Survey Conference—*National Research Council,* 168 p., $1.25.

Science News Letter, December 10, 1938

Botany—History

ROOTS, THEIR PLACE IN LIFE AND LEGEND—Vernon Quinn—*Stokes,* 230 p., illus., $2. Roots for food and flavorings, roots for drugs and poisons, roots for scents and dye-stuffs, roots in a thousand uses ancient and modern—their story is well told here, pointed up with anecdote, enlivened with charming drawings. Whether you are interested in botany, folklore or history, you will find what you are seeking here.

Science News Letter, December 10, 1938

Physics

HOUSEHOLD PHYSICS—Madalyn Avery—*Macmillan,* 439 p., $3.50. A text for college students in home economics which presents the fundamentals of physics in their relation to the home. Married college women may find it a handy volume to keep for reference, for it discusses the inner workings of all household appliances as well as more theoretical subjects.

Science News Letter, December 10, 1938

Psychology—Technology

JOB DESCRIPTIONS FOR HOTELS AND RESTAURANTS—U. S. Dept. of Labor and U. S. Employment Service—*Govt. Print. Off.,* 2 vols., 439 p., $2 per set.

Science News Letter, December 10, 1938

Pharmacy

A CONCISE PHARMACOLOGY—F. G. Hobart and G. Melton—*Chemical Pub. Co. of N. Y.,* 171 p., $3. A textbook for medical students written by a physician and a pharmacist.

Science News Letter, December 10, 1938

Biology

APPLIED MYCOLOGY AND BACTERIOLOGY—L. D. Galloway and R. Burgess—*Chem. Pub. Co. of N. Y.,* 186 p., $4. A handbook in the proper sense of the word; for this is a small volume but contains the gist of what the working microbiologist would care to know about a wide range of practical problems

Science News Letter, December 10, 1938

Photography

U. S. CAMERA, 1939—J. T. Maloney, ed.—*Morrow,* 196 plates, text and index, $2.90. Striking photographs in the modern manner. Of particular interest are the documentary photographs by the Farm Security Administration and the news photographs. You may like them immensely—or you may not.

Science News Letter, December 10, 1938

Horticulture

HEDGES, SCREENS AND WINDBREAKS—Donald Wyman—*Whittlesey House,* 249 p., illus., $2.75. There are many books on shrubs and their use in gardens and plantings, but something was needed on this special and important aspect of the use of shrubs. This book follows an accepted and useful treatment pattern, in that it tells essential facts about the most important hedge plants, and gives instructions for their planting, care, and trimming.

Science News Letter, December 10, 1938

Entomology

FIELD CROP ENTOMOLOGY—Don B. Whelan—*Swift,* 56 p., planographed, $1. A convenient, low-priced text adapted for the use of students in special courses in applied entomology. Well illustrated.

Science News Letter, December 10, 1938

Zoology

ZOO FRIENDS—Joanna Robb; pictures by Gilbert Cousland—*Collins,* 32 p., photos and text, $1.75. A picture book about the London Zoo, for children who have just learned how to read.

Science News Letter, December 10, 1938

Psychology

YOU CAN SLEEP WELL—Edmund Jacobson—*Whittlesey House,* 269 p., $2. If you are lying awake nights because you cannot relax, this book in popular style may give you some suggestions for wooing sleep.

Science News Letter, December 10, 1938

Electrical Engineering

STANDARDS ON ELECTRONICS, 1938—*Institute of Radio Engineers,* 59 p., 50 c.

Science News Letter, December 10, 1938

Entomology

MARVELS OF INSECT LIFE — Edward Step, ed.—*McBride,* 486 p., illus., $3.75. Really quite a lot of book for the money, with many interesting pictures and plenty of equally interesting text descriptions. Material has been gathered from all over the world, to make this book of hexapod natural history.

Science News Letter, December 10, 1938